

Application No. 10/643,043
Docket No. DP-308286
Amendment dated September 27, 2005
Reply to Office Action of July 27, 2005

REMARKS

In the Office Action, the Examiner reviewed claims 1, 3-7, 10-16, and 18-20 of the above-identified US Patent Application¹, with the result that all of the pending claims were rejected under 35 USC §103 in view of U.S. Patent Application Publication No. 2003/0150635 to Smith. In response, Applicants have amended the specification and claims as set forth above. More particularly:

The specification has been amended at paragraph [0011] to correct a grammatical error.

Dependent claim 7 and independent claim 13 have been amended to correct a clerical error, namely, the structural adhesive is now recited to have "a cure temperature approximately equal to the melting temperature of indium" (emphasis added), instead of "a cure temperature approximately equal to indium," the latter of which incorrectly states that indium has a cure temperature.

Applicants believe that the above amendments do not present new

¹ Though the Office Action states that claims 1 and 3-40 are pending and claims 1 and 3-20 were examined, claims 8, 9, 17, and 21-40 (as well as claim 2) were canceled in Applicants' response filed May 12, 2005. See 37 CFR 1.121(c)(4)(ii): "Cancellation of a claim shall be effected by an instruction to cancel a particular claim number. Identifying the status of a claim in the claim listing as 'canceled' will constitute an instruction to cancel the claim."

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matter and strictly comply with 37 CFR §1.116(a) as being limited to reducing and simplifying the issues remaining in the examination of Applicants' application, namely, addressing errors that could be the basis of 35 USC §112 rejections. Consequently, the above amendments do not raise new issues that would require further consideration and/or search by the Examiner, and place the claims in better condition for appeal.² MPEP §714.13.

Favorable reconsideration and allowance of remaining claims 1, 3-7, 10-16, and 18-20 are respectfully requested in view of the above amendments and the following remarks.

² MPEP §714.13 instructs:

It should be kept in mind that applicant cannot, as a matter of right, amend any finally rejected claims, add new claims after a final rejection (see 37 CFR 1.116) or reinstate previously canceled claims.

Except where an amendment merely *cancels claims*, *adopts examiner suggestions*, *removes issues for appeal*, or in some other way requires only a cursory review by the examiner, compliance with the requirement of a showing under 37 CFR 1.116(b) is expected in all amendments after final rejection. (Emphasis added.)

MPEP 714.13 further instructs: "The refusal to enter the proposed [Rule 116] amendment should not be arbitrary. The proposed amendment should be given sufficient consideration to determine whether the claims are in condition for allowance and/or whether the issues on appeal are simplified."

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Rejection under 35 USC §103

Independent claim 1, its dependent claims 3-7 and 10-12, independent claim 13, and its dependent 14-16 and 18-20 were rejected under 35 USC §103 as being unpatentable over U.S. Patent Application Publication No. 2003/0150635 to Smith. Smith cites priority back to the same priority document as U.S. Patent No. 6,238,938 to Smith, cited in the previous Office Action and withdrawn as a reference in the present Office Action.

Applicants respectfully request reconsideration of this rejection in view of the following comments.

Applicants' independent claim 1 recites an electronic assembly (10) that requires:

- a housing member (20) comprising a heat-conductive member (20,26);
- a substrate (14) supported by the housing member (20);
- a circuit device (12) mounted to the substrate (14);
- a solid solder joint (30) bonding the device (12) to the heat-conductive member (20,26) and consisting essentially of an indium preform into which one or more alloying constituents have diffused to increase the melting temperature of the solder joint (30) above that of the indium preform; and
- an overmold compound (32) that encapsulates the substrate (14), the device (12), and the solder joint (30), and has a cure temperature approximately equal to the melting temperature of indium but less than the melting temperature of the solder joint (30) so as to enable curing of the overmold compound (32) without adversely affecting the bond formed by the solder joint (30) between the device (12) and the heat-conductive member (20,26).

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Applicants' independent claim 13 recites an electronic assembly (110) that requires:

a housing (20) comprising a pedestal (26);
a substrate (14) supported by the housing (20);
a circuit device (12) mounted to the substrate (14);
a solid solder joint (30) bonding the device (12) to the heat-conductive member (20,26) and consisting essentially of an indium preform into which one or more alloying constituents have diffused to increase the melting temperature of the solder joint (30) above that of the indium preform; and
a structural adhesive (24) bonding the substrate (14) to the housing (20) and having a cure temperature approximately equal to the melting temperature of indium but less than the melting temperature of the solder joint (30) so as to enable simultaneous curing of the structural adhesive (24) and diffusion of the at least one alloy constituent into the indium preform.

Applicants believe that Smith does not disclose or suggest the following limitations found in Applicants' claims:

(1) The solder joint (30) is formed by an indium preform into which alloying constituents have been diffused (independent claims 1 and 13);

(2) The overmold compound (32) encapsulating the solder joint (30) has a cure temperature approximately equal to the melting temperature of indium but less than the melting temperature of the solder joint (30) (independent claim 1); and

(3) The structural adhesive (24) has a cure temperature approximately equal to the melting temperature of indium but less than the

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melting temperature of the solder joint (30).

Though pointed out in Applicants' remarks presented with their previous amendment, none of these differences were acknowledged or disputed in the present Office Action. As such, the present Office Action is incomplete under MPEP 706.07³ and 707.07(f)⁴. The section entitled "Response" in the present Office Action merely states that Applicants' arguments filed in their previous Amendment were "fully considered, but are moot in view of the new grounds of rejections detailed above." Therefore, the present Office Action does not "answer the substance" of Applicants' arguments filed in their previous Amendment.

If the Examiner's position is that the three limitations outlined above are merely process-related and therefore do not provide limitations to Applicants' claimed electronic assembly, Applicants must respectfully disagree. According to MPEP §2113:

The structure implied by the process steps should be

³ "[T]he final rejection . . . should include a rebuttal of any arguments raised in the applicant's reply."

⁴ "Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."

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considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting that terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.)

Within materials, diffusion is a process that occurs as a result of a compositional gradient. In the case of "a solid solder joint (30) . . . consisting essentially of an indium preform into which one or more alloying constituents have diffused to increase the melting temperature of the solder joint (30) above that of the indium preform," the result is unlikely to be the uniform alloy mixtures taught by Smith, but instead inherently some degree of a compositional gradient because "the solder joint solidifies as the alloying constituent diffuses into the solder joint" (Paragraph [0009]; emphasis added). Therefore, the "diffusion" limitation of claims 1 and 13 is not merely process-related, but instead is a compositional limitation of the solder joint 30 that can be observed by chemical analysis of the solder joint 30.

Melting and curing temperatures are physical and chemical properties of matter. Therefore, the melting temperature of the solder joint (30) and the cure temperatures of the overmold compound (32) and structural adhesive (24)

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are not merely process-related, but instead are compositional limitations to the types of materials that can be used for the solder joint (30), overmold compound (32), and structural adhesive (24).


Because Smith lacks any disclosure or suggestion of the above limitations, Applicants respectfully request withdrawal of the rejections under 35 USC §103.

Closing

In view of the above, Applicants respectfully request that their patent application be given favorable reconsideration.

Should the Examiner have any questions with respect to any matter now of record, Applicants' representative may be reached at (219) 462-4999.

Respectfully submitted,

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